

4.3 SOCIO-ECONOMIC ENVIRONMENT

4.3.1 Archaeological, Historic, and Cultural Resources

The project alignment covers land within five ahupua‘a from south to north: Wailua, South and North Olohena, Waipouli, and Kapa‘a. In terms of historic perspective, emphasis is placed on Wailua, Waipouli, and Kapa‘a—the three ahupua‘a that have the most comprehensive source material. Limited historic documentation regarding the Olohena lands suggest that these ahupua‘a did not play a major role in late pre-history and in the early historic era. Additionally, much of the Olohena lands were in sugar cane for many decades and, therefore, little in the way of archaeological constraints is expected within the mauka sections of the project alignments through these ahupua‘a.

Summary of Settlement Pattern in the Wailua Ahupua‘a

The Wailua River, along both shores, was the most important high-status area on Kaua‘i in pre-contact times. This area was the royal center where the high chiefs and chiefesses carried on their business when they were not traveling about the island(s), and where they entertained visitors. Today we see a small portion of this royal center when we look at the remnants of five of the heiau (where official decision making was carried out), the Pu‘uhonua o Hauola (place of refuge), the birthstones, the royal coconut grove, the bellstone, and the royal fishponds. There exist no visible surface remnants of the chiefly homes, the supporting lo‘i and kula lands, the places of recreation, the burial place called Mahunapu‘uone (just makai of Kapule’s fishponds), the fish traps, and the canoe landings.

The Wailua Complex of Heiau, on both sides of the river, was the focus of political and religious activity. Among the seven heiau of Wailua, Malae Heiau (at the river mouth on the south side) and Poli‘ahu Heiau (on the north side of the river inland atop Poli‘ahu Ridge) were two large companion heiau. The makai section of the ahupua‘a near the river mouth was the focus of daily life for the royal families. Some house sites were south of the river on the dunes (makai of the present highway), but the majority of house sites were on the north side of the river just mauka of the highway between the Coco Palms Resort and the river. A burial area is associated with these house lots on the dune and archaeological work shows there are still present remains of the habitation layer and the burials. A portion of Kapule’s fishponds, just behind the sand berm, still exists on the grounds of the Coco Palms Resort. The choicest house area, according to the Māhele documents, is probably in and around the Royal Coconut Grove. These homes were close to the river, Kalaeokamanu Heiau, the birthstones (where elaborate birthing ceremonies of royalty would take place), and the coconut grove.

Constraints in Wailua

The pattern of archaeological sites in Wailua ahupua'a is of almost contiguous historic sites (or former historic sites) located within the Wailua River valley, at the mouth of the valley, and in the flat coastal lands on the north side of the river mouth.

These archaeological resources may be an important issue in this area particularly as they involve potential impacts to archaeology within a State Park and may involve impacts in proximity to sites on the National Register of Historic Places. Very little in the way of adverse impacts is anticipated in the development of any of the former sugar cane lands back from the coast.

The designation of the Wailua Complex of Heiau National Historic Landmark (1988) consists of five discontinuous properties: Site -104, Malae Heiau; Site -105, Hikinaakalā Heiau (and petroglyphs); Site -106, Holoholokū (Kalaeokamanu) Heiau and Pōhaku Ho'ohānau, Site -107, Poli'ahu Heiau; and Site -335, the Wailua Bellstone(s). The designation of these properties for the National Register/National Historic Landmark listing is five circles each centered in the middle of each of the sites but only slightly greater than the radius of the sites themselves.

The south end of the alignment begins at the northern terminus of the existing Lydgate Bike/Pedestrian path near the northwest corner of the Aloha Beach Resort. The alignment heads north on an old railroad berm on the makai side of Kūhiō Highway a short distance to the Wailua River mouth. The proposed path will cross the Wailua River on a bridge cantilevered off of the existing cane haul bridge.

Located at the mouth of the Wailua River is the Wailua petroglyph site (Ka Pae Ki'i Mahu o Wailua, Site 50-30-08,105A) that was clearly regarded as "historically part of the temple of Hikina-a-ka-lā and the City of Refuge, Hau'ola (both sites coded 50-30-08-05)" (Kikuchi, 1984). Thus the petroglyphs should be regarded as a contributing element of the designated Wailua Complex of Heiau National Historic Landmark. There is some uncertainty regarding the extent of the Wailua petroglyph site as "The appearance of the boulders is determined by the vagaries of the weather, e.g., the flow pattern at the mouth of the Wailua River, the sand deposited by storms and the tides of the sea." (Kikuchi, 1984). Field inspection and available maps indicate that the petroglyph field is well to the southeast of any likely footing for a new bike/pedestrian path bridge.

On the north side of the Wailua River mouth, the path will pass the Coco Palms Resort on the makai side of Kūhiō Highway. A low rock wall will be constructed as a continuation of the existing rock wall. This presumably would involve some excavation for footings and foundations. Of concern in this area is the report of a burying ground or cemetery mentioned in the 1848 Foreign Testimony and Native Testimony as on the south edge of Land Commission Award 3346:1 to Nawai. This LCA lies just mauka of Kūhiō Highway and may possibly be the site studied by William Kikuchi (1973) when excavation for a new wing to the hotel uncovered thirty-four burials. This burying ground may extend

under and across Kūhiō Highway into the area proposed for construction of a wall extension. Buffum and Dega (2002) and Dega and Power (2003) further documented a traditional cultural layer in this area between Kūhiō Highway and the Coco Palms Resort. Because of the prospect for burials and/or other cultural resources, archaeological monitoring is appropriate in this area.

North and South Olohena Ahupua‘a

Only three archaeological sites have been designated within North and South Olohena ahupua‘a, but all are located on the coast. Little data is available for more inland areas, but the potential for archaeological resources mauka of Kūhiō Highway appears modest.

During a pedestrian inspection for this project conducted in December 2003, archaeologists with the consulting firm Cultural Surveys Hawai‘i found a stone and concrete railroad culvert at the intersection of the former railroad grade and the existing Kapa‘a temporary bypass road. The culvert crosses a drainage ditch which runs parallel to the temporary bypass road. This railroad culvert is understood to be a portion of the Lihue Plantation Railroad embankment (previously given State Site #50-30-08-823). Virtually the entire alignment of this railroad has been obliterated.

Constraints in Olohena

Previous archaeological studies have shown the presence of intact cultural deposits and traditional Hawaiian burials along coastal Olohena (such as sites 791 and 1800). A monitoring program with specific levels of archaeological monitoring appropriate for each path section will be developed with SHPD approval, and implemented during project construction.

Summary of Settlement Pattern in the Waipouli Ahupua‘a

Traditionally, Waipouli was known for its fine surf area. The Land Commission Awards show several house lots at the beach, but there are also house lots within the plots claimed for lo‘i and kula along the southern edge and within the marshy area toward Kapa‘a. While most of the claims are for lo‘i and kula, one LCA (8836) also claimed a fishpond and some wauke. This general area is known as Kapakio or the konohiki’s fishpond. Homes and kula were scattered around the pond where lo‘i would have been on the edges of the wetland and the flatlands were used for pasture and grasslands. The settlement in Waipouli, unlike adjoining ahupua‘a is spread from the shoreline inland and those living inland at the time of the Māhele also had houses with their lo‘i and kula, even in the most mauka claim (8838). The Boundary Commission record adds the locations of old home sites far inland, as well as locations of koa and kukui trees and places to catch wild fowl.

Archaeological work along the beach terrace of Waipouli has uncovered cultural layers both at the Coconut Plantation Resort area and the Uhelekawawa area (also known as Uhalekawa‘a), with dates for use during the 15th century for the former and the 16th century

for the latter. Archaeologists believe that the Coconut Plantation area was a recreational area due to its extensive layer but paucity of artifacts. The Uhelekawawa area has a thick cultural layer with the traditional artifacts representing activities such as tool manufacture for fishing and woodworking, and for weapons. The abundance of these tools suggested the area was a work site rather than a permanent habitation site.

The traditional landscape around the marsh was replaced by dry land in the 1960s when construction on the Waipouli Canal drained and filled the former marshlands which allowed for its use for sugar cane.

Constraints in Waipouli

The strongest expression of archaeological sites (cultural layers and human burials) at Waipouli is immediately on the coast such as designated sites 1801 and 1836. Site 1836 extends as far inland as Kūhiō Highway and four burials (Site -872) have been recovered from under Kūhiō Highway. Thus it must be assumed that other subsurface deposits and burials extend mauka of Kūhiō Highway particularly in the eastern portion of Waipouli. Most of the former sugar cane lands well mauka of the highway is anticipated to be free of archaeological sites. An archaeological monitoring program and consultation with the Kaua‘i/Ni‘ihau Islands Burial Council will be implemented for any area near or makai of Kūhiō Highway.

Summary of Settlement Pattern in the Ahupua‘a of Kapa‘a

The association of the ahupua‘a of Kapa‘a with legendary historical figure Mo‘ikeha implies that the area was settled previous to Mo‘ikeha’s time (early 14th century), although the extent of this settlement is not known. Through archaeological and other sources, it is known that at one time agricultural and domestic activities extended into the far mauka areas of Kapa‘a, but were totally abandoned by the mid 19th century.

The LCA pattern in Kapa‘a (as indicated by six awards) shows lo‘i and kula on the rim of the swamplands and extending partly into watered valleys. Marshlands without known LCAs may have had lo‘i along the edges. The six claimants had shoreline lots makai of the swamp. It is assumed that a permanent settlement existed in association with mauka agricultural lands in the prehistoric periods, but this is not reflected in the LCAs. The mauka settlements were probably abandoned before the 19th century. Permanent settlement occurred along the coast throughout late prehistory, as indicated by the presence of extensive and thick habitation deposits in the shore and backshore areas of Kapa‘a, especially along Inia Street and Kūhiō Highway (Hammatt 1991). However, in the early 20th century the entire area behind Kapa‘a Town was rice and kula lots and there was a rice mill in the area. When flood control measures were instituted in the 1960s, these marsh lands, used previously for taro and then taken over by the rice farmers, were drained and became cane and pasture land.

Constraints in Kapa‘a

The pattern of archaeological studies in Kapa‘a ahupua‘a is somewhat skewed with a dozen projects in urban Kapa‘a Town and very little work inland from the coast. Numerous burials and other subsurface sites have been reported from coastal Kapa‘a Town. The more inland studies, however, have generally reported minimal or no major findings. Given the large pre-contact and early historic populations of Kapa‘a and previous archaeological finds, on-site archaeological monitoring is warranted for any important subsurface impacts on or makai of Kūhiō Highway.

Potential Impacts and Mitigation Measures

Table 3 lists designated archaeological sites that lie in or near (with 300 feet) of the proposed bike and pedestrian path (see also Figure 16).

Table 3: Summary of Archaeological Sites that May be Affected by the Proposed Action

Site No.	General Location	Function	Relation to Preferred Alternative	Recommended Mitigation/ Comments
50-30-08				
105	Southern side of the mouth of Wailua River, makai of Kūhiō Hwy	Hikinaakalā Heiau and Pu‘uhonua o Hauola	Kūhiō Hwy runs just inland (approx. 70 meters)	Preservation as part of the National Historic Landmark; avoid vicinity
105A	Southern side of the mouth of Wailua River, makai of Kūhiō Hwy	Wailua petroglyph site (Ka Pae Ki‘i Mahu o Wailua)	Kūhiō Hwy runs just inland (approx. 50 meters); concern regarding possible new bridge	Preservation as part of the National Historic Landmark; avoid vicinity
872	South central Kapa‘a Town along Kūhiō Hwy	Designates human remains (4) from Kūhiō Hwy near Wana Road	Portion of Kūhiō Hwy near Wana Road	Monitoring program indicated for vicinity
823	Feature identified in South Olohena, inland of Kūhiō Hwy	Railroad berm and appurtenances	Remnants barely detectable in a few locations	Preserve remnants where possible
891	Coast near North Olohena/Waipouli boundary	WWII bunker	Near coastal path	Interpretation potential
1171	Between Coco Palms and Kūhiō Hwy	Traditional cultural layer	Between Coco Palms and Kūhiō Hwy	Monitoring program indicated for vicinity
1800	Coastal North Olohena	Cultural layer and burials (2)	Coastal North Olohena	Monitoring program indicated for vicinity
1801	Coastal Waipouli	Cultural Layer and burials (5)	Coastal Waipouli	Monitoring program indicated for vicinity

The results of the archaeological field assessment and consultation with the State Historic Preservation Division, Office of Hawaiian Affairs, and State Parks indicate that the preferred alignment is compatible with known archaeological and cultural resources. The Section 106 MOA provides for continued consultation through the project implementation phase.

Wailua Complex of Heiau.

The Wailua petroglyph site (Ka Pae Kii Mahu o Wailua, Site 50-30-08-105A) is regarded as part of the temple of Hikinaakalā and the City of Refuge, Hauola, both coded 50-80-08-105 and a contributing element of the designated Wailua Complex of Heiau National Historic Landmark. Field inspection and available maps indicate that the petroglyph field is well to the southeast of a new bike/pedestrian path bridge. An potential indirect effect is the potential increase in public traffic through Hikinaakalā Heiau and Hauola if users go off-path and take short-cuts from Lydgate Park to the Wailua River crossing.

Burials

After the Wailua Complex of Heiaus, the greatest archaeological and historic preservation concern for this project is the potential impact to human remains. Three concentrations of human burials have been documented along the proposed routes: along Kūhiō Highway extending back from the coast in Waipouli/Kapa‘a (including designated site 872); along the Waipouli coastline (including sites 1800 and 1801); and in the vicinity of Coco Palms (including the Mahuapu‘uone burial area).

In the vicinity of Waipouli/Kapa‘a, several burials have been encountered near the coast and in close proximity to Kūhiō Highway. Therefore, the probability of encountering human remains is higher along the coast or along Kūhiō Highway when construction requires subsurface work. This area is also particularly rich in other non-burial cultural resources. Mahuapu‘uone is a burying ground located primarily in the Coco Palms resort area (Cultural Surveys Hawaii, Aug 2004). However, the exact boundaries are unknown and could extend makai of Kūhiō Highway.

Mitigation of Impacts to Historic Sites

An archaeological monitoring program (including a monitoring plan, a combination of on-call and on-site monitoring, and a monitoring report) will be prepared and implemented to mitigate potential impacts to burials and other cultural resources that are believed to underlie portions of the proposed alignments. Particularly sensitive areas are understood to include areas of Jaucas sand in the Wailua, Waipouli, and Kapa‘a ahupua‘a that are well known for both burials and intact cultural deposits. These historical preservation concerns are anticipated to be greatest at the coast but may extend mauka of Kūhiō Highway in some areas. It is understood that the pathway project will have a very light footprint with much of the path requiring minimal excavation. Many of the burials and cultural deposits

previously documented, however, are quite shallow. The specific level of monitoring (on-call or on-site) will be determined with the SHPD for each path section. An excavation extending greater than 30 centimeters (about 1 foot) into undisturbed sediments is a possible benchmark for a higher level of monitoring.

Early consultation with the Kaua‘i/Ni‘ihau Islands Burial Council will be conducted regarding burial treatment. (See also, Memorandum of Agreement developed through the Section 106 consultation process and stipulation of procedures related to inadvertent discovery of human burials, in Appendix C.)

To deter path users from going off path in the Hikinaakalā section of the State park, the path’s design will incorporate landscaping, signs, and possible physical barriers (railings, fencing, or low walls). The Division of State Parks will be consulted during the design phase.

Historic Buildings and Structures

In addition to archaeological resources, the proposed action may impact historic buildings and structure that are listed on the National Register of Historic Places or may be eligible for listing. The information for this section is drawn from an Historic Resources Survey prepared by Mason Architects (2003) for the proposed Kapa‘a Relief Route. This study examined properties with construction dates of 1960 or earlier in areas where road construction or widening has been proposed. Given the overlap with the highway project corridor, the findings of the Mason study were used to identify historic resources or the types of resources that may be affected by the bike/pedestrian path.

The National Register of Historic Places (Title 36, part 60 of the Code of Federal Regulations), defines the criteria for legally evaluating the significance of cultural resources. It states that “the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association,” and

- (A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) that are associated with the lives of persons significant in our past; or
- (C) that embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) that have yielded, or may be likely to yield, information important in prehistory or history (U.S. Department of Interior, 1991, p. 37)

Mason Architects made a preliminary evaluation of eligibility based these criteria. The Hawai‘i State Register of Historic Places generally utilizes the same criteria as the

National Register; therefore, properties listed on the Hawai'i Register are usually considered eligible for the National Register.

The proposed action is expected to have adverse impacts on one of historic site: the Wailua River Plantation (or cane haul) Bridge.

Wailua Plantation (Cane Haul) Bridge. The Wailua River Plantation Bridge was acquired by the State only recently and has not been included in any of the historic bridge inventory studies conducted over the years. It was constructed in 1921 and has a roadway length of 395 feet, supported on seven intermediate and two end piers.

The bridge is only one of two bridges on the island converted from a railroad bridge to a road bridge. It is also one of only two extant concrete railroad bridges on the island. These concrete bridges are distinctive since industrial and railroad bridges in Hawai'i were primarily steel stringer bridges. The Wailua Railroad Bridge was an integral part of the sugar and pineapple economy on the eastern side of Kaua'i. It is one of the few remaining parts of the rail line, which represents a change in the 1920s from individual plantation ship landings to a more centralized transportation system.

Assessment of Significance: Satisfies Criteria A and C

Potential Impacts and Mitigation Measures

The proposed action will alter the bridge by adding a cantilever for the bike/pedestrian path. These changes, in effect, represent another step in the evolution of the structure. The Mason study concluded that the bridge has minimal integrity for materials and workmanship because they are obscured by a gunite coating over most of the original concrete. The integrity of design was diminished by the post-WWII addition of the deck portion and the more recent guard rails. Despite these changes, the study's authors noted that the bridge retains its integrity of location and enough original physical features to convey the feeling and association of its historic character.

To mitigate project impacts, the historic bridge will be documented in photos and text to Historic American Engineering Record (HAER) standards, or to a level determined by the SHPD. Another possible mitigation measure is to install a historic marker near the site with interpretive commentary.

Figure 16: Archaeological Sites (11 x 17)

Figure 18: Archaeological Sites (11 x 17) (back)

Cultural Impact Assessment

Act 50, Session Laws of Hawai‘i, 2000, requires that a proposed action’s impacts on the community’s cultural practices be disclosed in the environmental review process. A cultural impact assessment was conducted for the proposed Kapa‘a Relief Route by Cultural Surveys Hawai‘i (CSH) (Volumes I and II, 2004). Because the bike/pedestrian path corridor is fully contained within the highway corridor and both are linear transportation projects, the findings of the CSH study were reviewed for this environmental assessment.

CSH conducted historic research of the project to identify cultural resources and traditional cultural practices associated with the proposed relief route corridor. In addition, they conducted community consultation, with contact overtures to 54 parties regarding cultural knowledge, land use history, cultural sites, and traditional Hawaiian or other cultural practices in the vicinity of the project area. Nine interviews were completed but only seven interviewees signed authorization and release forms.

One of the primary concerns voiced by several kama‘āina, including some interviewees was concern about impacts on human burials (iwi kupuna). Based on background research, the most likely location for burials is in the sandy coastline sediments. Areas of specific concern include the coastal areas of Kapa‘a Town, Waipouli, Olohena (including adjacent to the present Kūhiō Highway), and Wailua. One kupuna who had witnessed the discovery of a large number of burials in the Wailua area adjacent to Coco Palms and Kūhiō Highway expressed serious concern about uncovering additional burials if a road were to be extended there. This area is thought to correlate with a documented historic sand dune burial ground, Mahunapu‘uone. Though the sandy sediments along the coastline are of primary concern, there have been a few isolated burials inland. The potential inland burial areas include locations of former kuleana, particularly in Wailua mauka of Coco Palms. Several of those consulted indicated that the discovery of iwi (bones) is a very sensitive issue for the Hawaiian community requiring much mediation and appropriate protocol.

A second very important cultural concern identified during consultation is related to the heiau of Wailua. The heiau complex is on the National Register of Historic Sites and a designated National Historic Landmark. Various groups have been working closely with the Division of State Parks to ensure protection of these historic properties and cultural sites. Those consulted stressed that the heiau are not just historic properties to preserve for their historic value, but also living cultural sites. Malae Heiau was mentioned specifically, but references to this site are more pertinent to the relief route project—the bike/pedestrian path will not impact Malae Heiau.

The marshlands of Kapa‘a, Waipouli, and Olohena were an important resource prior to Western contact. The fringes of the marsh were utilized for lo‘i kalo, and other resources including the gathering of kalukalu, a type of grass utilized for kapa (a paper-like cloth). Places in the marshes also served as fishponds. Vestiges of the cultural significance of the

marshlands are retained in the mo‘olelo (stories and myths) and ‘olelo no‘eau (proverbs) particular to this area. With the establishment of the sugar plantations in the late nineteenth century, the marshlands were altered considerably. Marsh areas were drained and filled to create more dryland for commercial agriculture and pastureland. Several individuals consulted and interviewed grew up fishing for ‘ōpae (shrimp) and ‘o‘opu (various brackish water fishes) in the irrigation ditches which once drained the swamps. They expressed sadness at the changing of the landscape and the passing of their childhood traditions with the final draining and filling of the swamps. No further concerns regarding the marshlands were expressed other than the presumed low potential of possibly encountering habitation deposits and burials related to former LCA parcels.

Several of the interviewees discussed ‘auwai in the Wailua ahupua‘a that were used by residents up until the 1960s. The ‘auwai were used for a variety of activities beyond their primary irrigation purpose. Most of the ‘auwai have been lost through modern pasturage, disuse, and adjacent road improvements. One kama‘āina expressed concern that the ‘auwai should be preserved for future generations.

Fishing and gathering along the coastline from Keālia to Hanamā‘ulu was and continues to be an important cultural activity. There is evidence that fishing and crabbing still occurs within the Wailua River. In many ways, fishing is not as easy as it once was, but fishing remains one of the few cultural traditions families still feel relatively free to engage in this area. Kama‘āina consulted and interviewed indicated that most of their families had long histories of fishing at various locales. Fishing traditions have been passed down through the ‘ohana and are viewed as a way to continue to perpetuate important aspects of the Hawaiian culture. A number of individuals expressed their concern that construction related to any proposed transportation improvement take into account water quality and potential negative impact on fishing resources. This is especially true in the case of the Wailua River, where a new bridge is being considered.

The primary recommendation that came out of the interview process was for continued consultation with concerned parties through the different phases of any major transportation project. Although most of the kama‘āina consulted grew up in an era when expressions of the Hawaiian culture were discouraged, they were all aware that Wailua was a unique place for their ancestors.

The issues raised by the cultural impact assessment reflect a deep connection with the land and its resources. The proposed path is a low-impact way to provide safe, convenient, and comfortable access for people. Consistent with the concerns expressed by the interviewees, it is the intent of the project to enhance access in a way that is respectful of historic and cultural resources. For example, the path located on the north side of Wailua House Lots is adjacent to an irrigation ditch or ‘auwai. By making this geographic feature a part of everyday experience, it provides an opportunity for younger generations to learn about the area’s agricultural water infrastructure and plantation history.

The Lydgate Park-Kapa‘a path alignment passes through areas currently used for lateral beach access. The path will not diminish, but enhance access for those engaged in fishing and other traditional uses, particularly for those with mobility difficulties.

Past experience suggests the possibility of inadvertently uncovering ancient human remains in sections of the path that traverse the soil type known as Jaucus sand, and adjacent to Kūhiō Highway. A Memorandum of Agreement signed by the County, FHWA, and appropriate State authorities has specified proper handling of such discoveries (see Appendix C).

4.3.2 Population and Demographic Factors

The population in the project corridor includes a mix of households living in neighborhoods of single-family homes, short- and long-term residents in condominiums and time-share units, and transient visitors in hotel units.

The proposed path passes through portions of Census Tracts 402.02 (Wailua) and Census Tract 403 (Kapa‘a). According to the 2000 Census, 15,402 people lived in these two census tracts. The adjacent census tract to the north, Census Tract 402.01 (Keālia), had a population of 3,123, thereby producing a total population in the immediate region of 18,525 people. This number constituted 31.6% of the Kaua‘i’s population of 58,463 in 2000, or slightly less than a third of the total.

In 2001, the Department of Business, Economic Development, and Tourism (DBEDT) reported that Kaua‘i’s average daily visitor census was 16,830. The 2000 *Kaua‘i General Plan*, reported that, in 1999, 30% of the island’s visitor units were located in the Kawaihau District. The Plan also pointed out that occupancy rates in the district are consistently 5 points below the islandwide average. After adjusting for these ratios, it is estimated that the average daily visitor census in the Wailua-Keālia region is 4,645. Combined with the residential population, the region had a *de facto* population of approximately 23,170 in the 2000-2001 time period. Assuming slight growth in the resident population since the 2000 census, and an increased visitor count due to a rebounding economy and travel market, an estimated daily census of 24,000 would be reasonable.

In the near term, visitor and residential growth is expected to occur within the project area. Construction is underway at the Waipouli Beach Resort and the redevelopment of Coco Palms Resort, closed since Hurricane Iniki, is expected to begin shortly. Two new resorts are planned for the Waipouli coast involving some 525 units. A residential development called Courtyards at Waipouli with 82 affordable units is planned for a parcel bordered by Kūhiō Highway, Lanikai Street, and Papaloa Road.

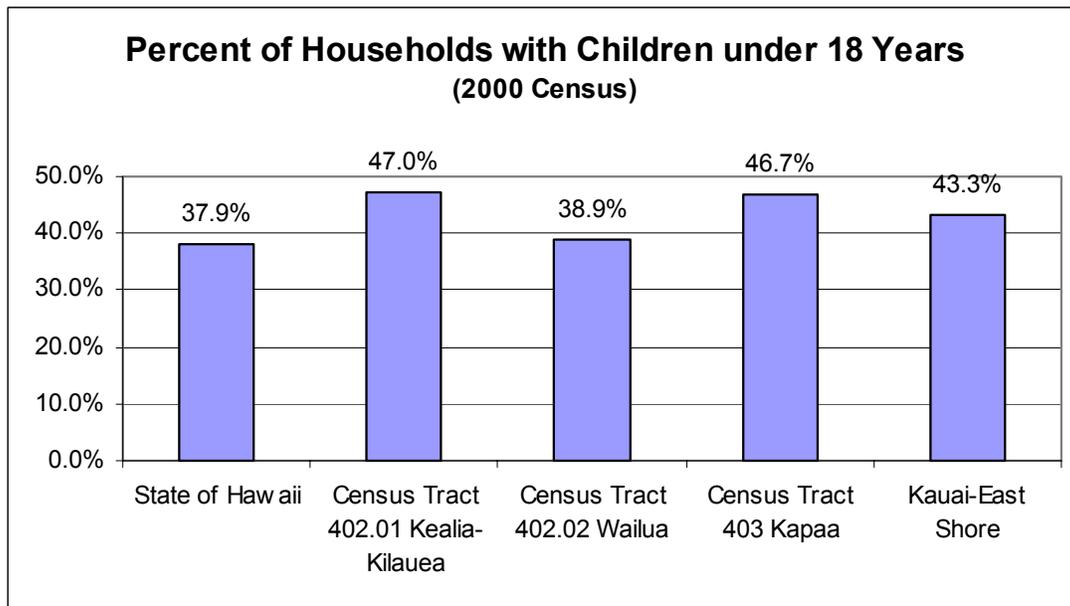
The demographic numbers show that the Wailua- Kapa‘a region has one of the largest concentrations of population on Kaua‘i. What distinguishes the region is the mix of residential and visitor populations and the density of commercial activity. In contrast,

Līhu‘e is the County seat, but it is largely a commercial-residential center (with fewer visitor units), while Po‘ipū is a major visitor destination (however, without a substantial residential population), and the North Shore has a large population of visitors and residents (but lacks the critical mass of commercial activity found in Wailua- Kapa‘a).

School-aged children are expected to be among the principal beneficiaries and users of the proposed bike/pedestrian path. Safe Routes to Schools, a national nonprofit organization, estimates that 66% of all children walked to school thirty years ago. They point out that walking or biking to school gives children a sense of freedom and responsibility, allows them to enjoy the fresh air, and provides opportunities to get to know their neighborhood. Yet today, only 13% of American children walk or bike to school. Transportation research attributes 20-25% of morning traffic to parents driving their children to school.

In a survey of public and private school principals in suburban Oahu and the neighbor islands, 85% of the respondents cited the perception of unsafe roadways and high traffic levels as the most notable impediments to increased bicycle commuting (Kimura International, 2002). These factors are especially pertinent in a region such as Wailua-Kapa‘a where there is a large proportion of households with school-aged children (see Figure 17). According to the 2000 Census, 37.9% of all Hawai‘i households had children under 18 years of age. In comparison, each of the census tracts in eastern Kaua‘i exceeded this percentage and, collectively, 43.3% of the households in the region had one or more children of school age.

Figure 17



Potential Impacts and Mitigation Measures

The proposed action is not expected to have an impact on the number of people in the area or to change the demographic characteristics. However, an analysis of the existing population supports the need for a shared use path in the area. There is a concentration of residents and visitors within a relatively small area, and within comfortable walking and bicycling distances to numerous businesses and community facilities. The region is also home to large segments of the population that are unable to use the motorways, notably children and teens. Improving the transportation infrastructure for pedestrians and bicyclists will help to increase the mobility of these groups. The project will not have an adverse impact on low-income or minority populations or neighborhoods.

4.3.3 Economic and Fiscal Resources

The economy of Kaua'i has transformed over time from a plantation economy to a modern economy with a mix of tourism, diversified agriculture, construction, retail, and professional businesses. Through the early 1990s, the island economy worked to recover from the closing of the sugar plantations, the devastating aftermath of Hurricane Iniki, and a national economic slowdown. Today, the economy appears buoyant as evidenced by an unemployment rate in April 2004 of 3.9% (not seasonally adjusted). Although slightly higher than the unemployment rate for the state as a whole (3.6%), it was nonetheless lower than the U.S. rate (5.4%). Moreover, the unemployment rate the year before, in April 2003, stood at 5.6% (State Department of Labor and Industrial Relations, 2004).

Industries

The largest industries in terms of jobs are trade (retail and wholesale) and services. In 2002, hotels and food services accounted for 6,650 jobs, retail trade had 7,950, and professional and business services had 4,400. In a study by the State Department of Labor and Industrial Relations, service and production jobs were expected to account for about half of all job growth through the year 2008.

Income

Personal income of County residents has been increasing over time, but not as fast as the State as a whole. The per capita disposable income level for residents of the County has fallen below income levels for the state since the mid 1970s. In 2001, per capita income in Kaua'i County was \$23,786 (in current dollars) compared to \$29,034 for the state as whole. The per capita income for all counties (excluding the City and County of Honolulu) was \$23,666.

The 2000 Hawai'i Health Survey indicated that 21.9% of the County's population was below the poverty line, compared to 14.1% of the statewide population. This study also found that the "extremely low" and "low" income groups (households with incomes up to

\$30,000) form a larger share of the County population than the comparable proportion for the state as a whole. These statistics indicate a higher degree of segmentation in the island population among those at the higher and lower ends of the income spectrum.

Potential Impacts and Mitigation Measures

Short-term Economic Impacts

The proposed action is anticipated to have several types of economic impacts. One type is construction related employment and income. With a preliminary estimated cost of several million dollars, the project is expected to support a number of engineers and construction workers for the duration of the design and construction efforts (approximately 24-30 months). Unless the economy expands considerably and existing firms are working at full capacity, this project is more likely to help sustain existing employment and income levels than to create new jobs. However, because project funds are coming from (federal) sources outside the region, the wages paid to workers on this project (direct income), payments to suppliers (indirect income), and their subsequent expenditures (induced income) could have a large cumulative impact as the monies circulate through the local economy.

Indirect and Cumulative Economic Impacts

Business opportunities related to recreation equipment rentals and sales and refreshments is another source of potential economic impact. Increased spending by local residents and visitors would benefit operators and merchants located along the path. The east side tourism market would also benefit from an attractive outdoor recreation amenity. The San Antonio Riverwalk is the anchor of that city's billion dollar visitor industry. With vision, the city was able to turnaround a neglected waterway and make it the focal point of commercial life, creating a unique shopping and dining district (National Park Service, 1990).

Fiscal Impacts

County revenues are primarily limited to tax revenues on privately owned property and improvements. To the extent that the path contributes to the competitive advantage of the East Kaua‘i visitor market and the local shopping environment, it would have some impact on rising property values (and, therefore, rising taxes). However, this impact is indirect and of uncertain magnitude, given the array of factors that shape economic markets. The path itself will be built in public rights-of-way and, as a public facility, will not generate taxes.

On the other hand, the County will need to maintain the facility. Additional personnel may be required in the Division of Parks and Recreation to assist current staff with maintenance activities. A budget allocation will be needed to support the workers and their equipment. At the same time, as the path system increases, there may be economies of scale that allow

for more efficient operations, for example, by making it cost effective to acquire specialized path-sweeping equipment.

Property Values

Concerns have been raised that the proposed facility might reduce the value of adjacent properties. In fact, this issue is often raised when a community considers building a shared use path or trail. The study that has received the most attention on this subject involves the Burke-Gilman trail in Seattle. The Seattle Engineering Department and Office for Planning (Punochar and Lagerwey, 1988) conducted an in-depth study of the trail to determine what effect, if any, the trail has had on quality of life, property values, and crime rates experienced by property owners near and adjacent to the trail. The 12-mile Burke-Gilman Trail was constructed in 1978 and provides a multi-purpose, non-motorized path. At the time of the study, there were 152 single-family homes and 607 condominiums immediately adjacent to the trail and 320 single-family homes within one block of the trail. The trail draws over 750,000 users per year of which 80% are bicyclists and 20% are pedestrians; 80% are recreational users, and 20% are commuters.

Data for the study came from several sources, including residents near and adjacent to the trail (72% of all property owners were interviewed), real estate agents, police officers who patrol the affected neighborhoods, and real estate advertisements in newspapers and magazines. The study found that property near, but not immediately adjacent to, the trail was easier to sell and sold for an average 6% more as a result of its proximity to the trail. Property immediately adjacent to the trail sold for 0-0.5% more. Residents who bought their homes after the trail was opened tended to see it as a positive factor that increases the value of their home. Longtime residents who bought their homes prior to the opening of the trail were less likely to view the trail as an economic asset. Real estate advertisements consistently used the presence of the trail as a selling point.

Less than 3% of the homeowners said there were any problems associated with the trail that were serious enough for them to consider moving. The 3% that would consider moving as a result of the trail sought greater privacy and were not motivated by crime or other problems. Almost two-thirds of the residents felt the trail increased the quality of life in the vicinity. None of the residents surveyed felt the trail should be closed.

A similar study was conducted by the Colorado Department of State Parks in the metro Denver area (Macy and Alexander, 1995). Three two-mile, non-motorized segments were studied by surveying property owners, police, real estate agents, and others. The segments run along natural waterways, through neighborhood, commercial, and retail areas, and are used by recreational users, commuters, pedestrians, and bicyclists.

Seventy-three percent of the real estate agents interviewed thought that the properties adjacent to or within one block of the trail would sell faster and for more money than an equivalent property farther away from the trail. Twenty-nine percent of the single-family homeowners located adjacent to a trail thought their property value had increased and 57%

thought that the property would be on the market for a shorter period of time. Forty-two percent of the owners of multi-family housing thought their property had increased in value and none thought that the property value had decreased. Most of the owners who bought their property after the trails were constructed considered the proximity to the trail as a positive attribute. The most serious security issues were graffiti and tagging.

4.3.4 Scenic and Visual Resources

The 2000 *Kaua‘i General Plan* identifies important scenic resources, such as major land forms, open spaces, viewing points, and scenic drives. The Plan’s Kawaihau Planning District Heritage Resources map was reviewed to identify resources that may be affected by the project. Within the project area, Kūhiō Highway, from Lydgate Park to the coconut grove in Waipouli, is identified as a scenic roadway corridor. Views along the coastline and of Nounou Mountain (the renowned Sleeping Giant) are also notable visual resources.

Potential Impacts and Mitigation Measures

This project is not anticipated to have noticeable impacts on view planes of the coastline from the highway nor will it adversely affect public areas set aside as scenic points. For the most part, the proposed path is a flat, structure-less passage way that will not intrude on the natural landscape. The intent of the path is to create a safe and convenient way for people to enjoy the natural environment; therefore, a key design objective is to maintain the existing setting. To minimize the visual impact, the path should be constructed with materials and colors that blend into the natural environment.

The proposed changes to the bridge across the Wailua River will give it a new face toward the ocean; however, the basic structure will remain unchanged.

The path also creates a positive impact by offering people an opportunity to enjoy some of the region’s best views. Because the path will be ADA compliant (where technically feasible) and define a clear public pathway, it will expand access to view corridors for a larger segment of the community.

4.3.5 Existing Land Uses and Community Character

The project area encompasses a wide variety of existing land uses. On the makai fringes of the project area are beaches and park land, while large tracts of fallow agricultural land lie on the mauka side. In the developed section, hotels, condominiums, and time-share developments form a row on the coastline. (Additional resort “infill” is likely since several large vacant parcels are zoned for resort use.) Strip commercial lines both sides of Kūhiō Highway, through the heart of the project area, with businesses in small commercial buildings and converted residences interspersed among large shopping centers. There are pockets of detached residences on the coastal plain; however, more extensive residential developments cover the mauka hillsides. Overall, the urbanized area is compact and well-defined. The scale of development is modest and in keeping with the tenor of the island. Most buildings are one- and two-stories tall; some resort properties have mid-rise buildings.

The project alignment generally follows existing travel ways, some more clearly delineated than others. Some sections of the alignment are located primarily alongside existing roadways and will involve converting shoulder areas and sidewalks into a fully improved bike/pedestrian path. Coastal sections are located in park land or along coastal roads. Sections that go inland are primarily aligned along the north-south drainage canals. Where possible, the path will be located on or within easements that are adjacent to the canal and established for the purpose of maintaining the canals.

Potential Impacts and Mitigation Measures

The proposed action is not anticipated to have an adverse impact on existing land uses. The path is for pedestrians and others traveling in non-motorized vehicles (except as authorized—for example, wheelchairs). These activities regularly occur in neighborhoods without complications. The project does not include any additional parking. Path users are expected to walk or bicycle to the facility, a reasonable expectation given its urban location. Others may drive to parking areas located at both ends of this particular segment (Lydgate Park and Lihi Park).

Concerns have been raised about the safety of path users (for example, potential conflicts between bicyclists and pedestrians), as well as compatibility between path uses and activities occurring on adjacent properties. Safety is a foremost concern that will be addressed through design, operation, and management of the facility. The facility will be designed in conformance with current standards established by the American Association for State Highway Transportation Officials and other professional organizations. Recommendations on the width of the facility, vertical and horizontal clearances, and sight lines are all intended to provide sufficient space for different types of users and for safe passing maneuvers. Collisions between users tend to occur in congested sections, typically within one-half mile of the path entry points. Because the Lydgate Park to Kapa‘a segment occurs in an urban area with multiple access points, it is less likely to have bottlenecks.

A related concern is the potential for accidents between path users and people (especially children) who may be playing on adjacent lawns or parklands. The path must be designed with adequate sight lines. And people have to exercise caution anytime there is cross traffic. The primary concern is with bicyclists on the path. Speeding is sometimes a factor (for example on the Burke-Gilman Trail in Seattle), but it is important to take into account the user profile on any given path. The demographic of potential path users in Kapa‘a is in sharp contrast to the large numbers of rushed college commuters in Seattle.

There is already local precedent of path coexisting with its residential and resort neighbors. A one-mile stretch of bike path has served the community for two decades. A new path has an opportunity to establish a culture of use. Supplemented with strategically located signs and user education, courteous and responsible use of the path is possible.



Existing path near residences in Kapa‘a (path to be reconstructed as part of the improvements for the Kapa‘a-Keālia segment)



Existing path in front of the Pono Kai Resort (path will be reconstructed as part of the Kapa‘a-Keālia segment)

4.4 TRAFFIC AND CIRCULATION

Kūhiō Highway (State Highway No. 56) is part of the National Highway System and the main land transportation facility through the project area. The highway serves regional through traffic between Līhu‘e and the North Shore. It also passes through the heart of the Waipouli-Kapa‘a commercial area; therefore, it also serves the local circulation needs of residents and businesses.

The proposed action starts at a point located between the highway and the Aloha Beach Resort. In this area, the highway consists of two northbound lanes and one southbound lane. The three-lane configuration continues across Wailua River to Kauai Village Shopping Center. Between Kauai Village Shopping Center and Waika‘ea Canal, the highway has one travel lane in each direction and a middle lane reserved for multi-directional left turns. North of the Waika‘ea Canal, the highway becomes a two-lane highway with one lane in each direction. Posted speed limits through the urbanized area vary from 25 to 35 mph. Some sections of the highway are improved with curbs and sidewalks; however, these improvements are not continuous.

In 1995, a former cane haul road mauka of Kūhiō Highway was converted into a temporary bypass. The two-lane road has been able to divert some traffic between Waipouli and Kapa‘a. Additional relief will be provided by a near-term plan to extend the northern end of the temporary bypass, along the mauka side of Kapa‘a New Park, across Mo‘ikeha Canal, to Kūhiō Highway, just south of Hau‘a‘ala Road—although this extension will be reserved for southbound traffic only. HDOT has also initiated other short-term measures

to relieve congestion, including widening limited sections of Kūhiō Highway to four lanes and constructing an additional vehicular lane across Wailua River. In the longer term, the State is studying several alternatives to increase highway capacity, including combinations of a widened Kūhiō Highway and new segments that bypass the existing highway. .

The County of Kaua‘i has jurisdiction of the local streets in the project area with the exception of Niulani Street and Hoi Road, which are privately owned. Local streets provide access to individual residences and businesses. Most County roads are not improved with curbs and sidewalks. However, there are exceptions, for example, on Kawaihau Road fronting Mahelona Hospital and Kapa‘a Elementary School.

Potential Impacts and Mitigation Measures

Future Relief Route

The State DOT is in the planning stages for a long-term solution alleviate congestion from Hanamā‘ulu to Kapa‘a. Called the Kapa‘a Relief Route project, it is very likely that the bike/pedestrian path will be completed before the Relief Route. As this environmental assessment was prepared, several alternatives were being considered, but only two potential crossing locations over Wailua River.

Mauka Crossing. The mauka crossing would be located between Smith’s Tropical Paradise and the Marina Restaurant. If this crossing site is selected, the State DOT is expected to have sufficient roadway capacity to discontinue using the cane haul bridge for vehicular traffic. This bridge could then be conveyed to the County for the bike/pedestrian path.

The mauka highway alignment would also impact the proposed bike/pedestrian path through Wailua House Lots, which follows a mauka-makai alignment. The path would intersect with a mauka bypass highway. At Hale‘īlio Road (another mauka-makai road), some of the design options being considered call for the bypass highway to be located in a channel below ground level so that Hale‘īlio Road would pass over the highway. Plans for the bypass highway have addressed the need for a grade separated crossing where the highway intersects with the bike/pedestrian path north of the subdivision.

Existing River Crossing. Another option being considered is to build a new, six-lane bridge at the approximate location of the existing bridges. Preliminary engineering studies indicate that both existing bridges would have to be demolished, with the cane haul bridge site used to phase in construction. If this option is selected, the new bridge must continue to provide connection for the path, as required by federal transportation policy. All alternatives for the proposed bypass highway provide for a bicycle facility (bike lane or shoulder bikeway); however, if the new bridge is part of the bike/pedestrian path, it would have to be designed to accommodate bicyclists and pedestrians.

If the existing river crossing site is selected, the highway would be widened between the river and Hale‘ilio Road, then turn in a mauka direction (north of Hale‘ilio Road) to bypass the Waipouli-Kapa‘a area. The new bypass highway would cross the bike/pedestrian path in this vicinity. Therefore, highway designers will have to address the safety of path users.

Short-term Transportation Improvements

In addition to a long-term solution to improve the regional highway system, State, federal, and County officials are working on short-term measures to relieve congestion in Wailua, including the addition of a fourth lane to Kūhiō Highway from Wailua Bridge to the temporary bypass road. Capacity across Wailua River will be expanded by replacing the existing, single lane deck of the cane haul bridge with a new deck wide enough for two vehicular lanes. This stretch of highway currently contains two northbound travel lanes and one southbound travel lane. The improvements will add a second southbound lane. Improvements to the bridge and highway will accommodate the bike/pedestrian path. A separate Environmental Assessment is being prepared for improvements across Wailua River.

Development in the State Right-of-Way

The State Department of Transportation has commented that Kūhiō Highway, with a 60-foot right-of-way, has limited space to accommodate a bike/pedestrian path. *Bike Plan Hawaii 2003* had proposed a bicycle facility along the highway, but the proposal was for a shared use road in which bicycles would use a narrower, 5-foot wide paved shoulder. Despite the space constraints, the proposed alignment contains path segments located along the highway. The alignments were necessary for several reasons:

- Lack of space in the built-up area makai of the highway
- Absence of other north-south roads that can accommodate the bike/pedestrian path
- Desirability of providing access to major destination nodes that are located on the highway

Specific sections of the highway right-of-way that are affected are shown in Table 4.

Table 4: Path Segments Located Adjacent to Kūhiō Highway (in State Right-of-way)

	Section of alignment
Main north-south alignment	Project start (near Aloha Beach Resort) to Wailua Beach Park, makai side of highway Crossing highway at Lanikai Street Snorkel Bob’s to Waipouli Beach Resort, makai side of highway Crossing highway at Kauai Village Shopping Center Kapaa Shores Resort to Ala Road, makai side of highway

Besides occupying land within the right-of-way, the proposed path will affect highway traffic. Path users will be traveling in two directions and encouraged to follow the typical convention of staying on the right side of the travel way. If a path is located on the makai side of Kūhiō Highway, this means that path users going southbound, will be next to motor vehicles traveling northbound or in the opposite direction. In such situations, the path will have to be designed to ensure adequate separation and differentiation between the two transportation facilities, for example, with barriers. Acquisition of private property adjacent to the existing right-of-way may be necessary to provide adequate space.

Bridges. The bike/pedestrian path will need to cross Wailua River. HDOT is in the process of acquiring a permanent easement for the cane haul bridge and its approaches, which pass through the Wailua River State Park.

A new bridge is also needed across Uhelekawawa Canal. The bridge will be located mauka of the McDonald’s restaurant, which is outside the Kūhiō Highway right-of-way. It is being designed and constructed by owners of the Waipouli Town Center and Kauai Village Shopping Center to satisfy outstanding conditions of development permits. Upon completion, the bridge will be dedicated to the County and integrated into the overall bike/pedestrian path.

Conversion to One-Way Traffic

One road segment is proposed for conversion to one-way traffic flow: Moanakai Road between Keaka Road and Panihi Road. Changes in the operations of County roads require approval by the County Council.

The proposed conversion on Moanakai Road will include a short section of Keaka Road (makai of Niulani Street), and Moanakai Road itself from Keaka Road to Panihi Road, a combined distance of approximately 1,350 feet. The cross streets, Keaka Road (mauka of Niulani Street), Makaha Road, and Panihi Road, will continue to carry two-way traffic. Moanakai between Panihi Road and Lihi Park will also remain a two-way road.

Moanakai is a residential street with 17 residential properties on the mauka side and a beach on the other side. Besides the residents, the road is used by people going to Baby’s Beach (also called Fuji Beach), Lihi Park, and the State’s small boat ramp. The makai side of the road is a popular parking spot, with cars parallel parked next to the beach between shade trees.

The one-way conversion has been proposed in order to accommodate vehicular traffic, parking, and the bike/pedestrian path. Traffic flow will be restricted to northbound only. The northbound direction was selected for ease of access to Lihi Park (Waipouli Park) and the Small Boat Harbor and to maintain the current orientation of parked vehicles. If conversion is not approved by the County Council, Moanakai will be a signed road shared by two-way traffic and path users.

During the planning process, Papaloa Road from Kūhiō Highway to Lanikai Street was also considered for conversion to one-way use. However, this proposal was not included in the final project description after coordination with new highway improvement initiatives, consideration of traffic generated by the proposed housing complex at Papaloa Road and Lanikai Street, and an adjustment to the path alignment that eliminated the need to use a County easement next to Shell Service Station.

On-street Parking

The existing sidewalk on the makai side of Papaloa Road will be widened and extended between Kūhiō Highway and Coconut Marketplace. To accommodate this improvement, on-street (parallel) parking may be restricted on the makai side of Papaloa Road. This change is expected to eliminate parking for up to 12 vehicles. The area is used as overflow parking for Wailua Beach Park and Kinipopo Shopping Center, and by customers of the kayak rental operation at the Shell Station. On-street parking will still be allowed on the mauka side of Papaloa Road. Near-term improvement in Wailua Beach parking is forthcoming when the developer of Coco Palms upgrades the existing parking area located adjacent to Seashell Restaurant.

Cross Traffic

The project alignment was laid out to minimize situations where pedestrians and bicyclists would have to cross driveways, streets at mid-block, and streets with unsignalized intersections. However, because the paths are located in urbanized areas, alignments that do not cross driveways and streets could not be avoided completely. Table 5 shows the locations where cross traffic issues will need to be addressed in the design phase.

In stretches containing driveways, maintaining adequate sight distance is a key consideration for both motorists and path users (particularly bicyclists).

Midblock crossings have been located away from existing intersections to be clearly separate from the activity that occurs as motorists approach these intersections (such as

merging movements, acceleration/ deceleration, or preparations to enter turn lanes). In addition, other variables to consider include right-of-way assignment, traffic control devices, sight distance, refuge islands, and pavement markings.

The intersections at Kūhiō Highway and Lanikai Street and Kuhio Highway and Kawaihau Road are currently unsignalized. During the design phase of this project, the County will determine whether user-activated signals are warranted and provide recommendations to the State Highways Division. At Lanikai Street, there is a proposal is to install a new traffic signal that would be synchronized with the existing signal at Kūhiō Highway and Hale‘ilio Road.

Table 5: Cross Traffic Locations for the Shared Use Path

	Driveways	Unsignalized Crossings	Midblock Crossings
Lydgate Park to Kapa‘a	Seashell Restaurant (after renovation) Papaloa Road Lanikai Street Kūhiō Hwy: Snorkel Bob’s to Ala Road Niulani Street	Papaloa Road at Lanikai Street Kūhiō Hwy at Lanikai Street	Temporary Bypass Road
Wailua House Lots Phase	None		
Kawaihau Phase		Kūhiō Hwy at Kawaihau Road	

In addition to user-operated traffic signals, other design measures that can be used at intersections include: stop signs, warning signs and devices (such as flashers) as approach treatments, and refuge islands. All traffic control devices will be compliant with the Manual on Uniform Traffic Control Devices. As mentioned previously, any new traffic signal, for example at Kūhiō Highway and Kawaihau Road, will have to meet warrants (minimum requirements). The signal will need to be coordinated with signals upstream and downstream to keep traffic moving through the corridor.

Bus Service

The Kaua‘i Transportation Agency provides a public bus service, called the Kaua‘i Bus. As of late 2003, the fleet included 35 light/medium-duty buses distinguished by the green

sugar cane motif wrapped around each bus. Up to 20 buses are on the road at one time. There is a 50-50 split between fixed-route and paratransit service. To operate this fully integrated system, the agency maintains a capacity for interchangeability in terms of equipment and personnel—vehicles are equally capable of getting to a bus stop or a residence. The buses were retrofitted recently with bicycle racks.

Bus service on the east side of the island is comprised of two main line. One goes up to Kapahi in the Kapa‘a area, and the other goes north to Hanalei (see Figure 18). The Kapa‘a-to-Līhu‘e segment has the highest ridership. On a monthly basis, there are about 6,000 person-trips on the Kapa‘a/Hanalei-to-Līhu‘e route, or slightly more than half the islandwide total. The number of bus users is increasing at a rate of 2-3% per year. Riders are primarily seniors, disabled people, and commuters on fixed schedules. Ridership is growing among young people and there is bump in bus usage during summer months, coinciding with the long school break.

Service runs from 5 am-7pm on weekdays with limited Saturday service. According to customer feedback received by the agency, few people seem to want evening or weekend service.¹

Potential Impacts and Mitigation

The proposed bike/pedestrian path provides opportunities for intermodal connection. The alignment passes two bus stops in Waipouli: at the Waipouli Shopping Plaza and the Kauai Village Shopping Center. The stops allow path users to reach more distant parts of the island via public transit.

Because the bus stops occupy space within the highway right-of-way—where sections of the path will be constructed—the path’s design will be coordinated with the Transportation Agency to ensure that the requirements of both facilities are accommodated. Further, the path will be designed in accordance with ADA guidelines for wheelchair access at bus stops. During the construction period, it may be necessary to temporarily relocate a bus stop. Any such move will be made in consultation with the Transportation Agency.

¹ Meeting with Janine Rapozo, Executive on Transportation, October 9, 2003.

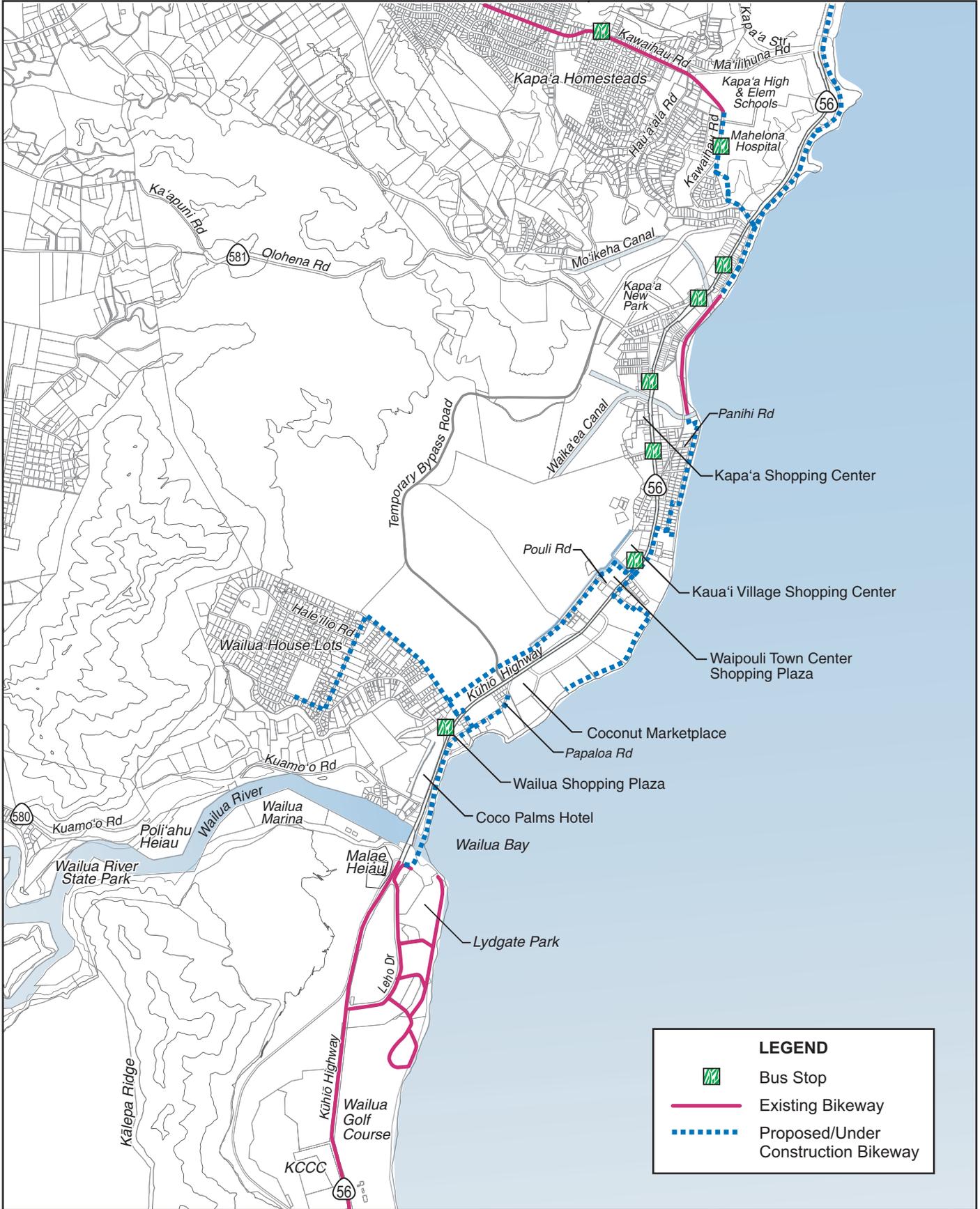
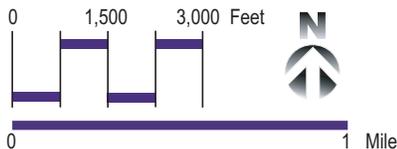


Figure **18**

Wailua Bus Routes and Bikeways



4.5 PUBLIC INFRASTRUCTURE AND FACILITIES

4.5.1 Drainage System

No improvements to the existing drainage system will be needed for the project. Existing drainage patterns will be maintained. Runoff will continue to sheet flow across the path to existing swales and drainage structures.

Grading of the site will comply with the County's grading regulations and the recommendations of the geotechnical engineer.

4.5.2 Water and Wastewater Systems

Water Service

The County of Kaua'i, Department of Water provides water service throughout the island. Water lines are generally located in the streets and distribute potable water for domestic, industrial, and commercial consumption and for fire protection.

Wastewater Service

The wastewater system is also operated by the County. Sewage from the Kapa'a, Waipouli and Wailua areas is collected through the County sewer system via gravity lines and collected at sewage pump stations located along Kūhiō Highway and Papaloa Road. Sewage is pumped through force mains to the Wailua sewage pump station located at the intersection of Kūhiō Highway and Hale'ilio Road. Sewage is then pumped via a force main to the wastewater treatment plant located on Leho Drive.

Potential Impacts and Mitigation Measures

The proposed action is not expected to generate a marked increase in demand for water. During construction, water will be used for dust control and to expedite the growth of plant cover for erosion control. Over the long term, however, water use will be minimal. The proposed action does not include restroom facilities. Low-maintenance, drought-tolerant plants will be used for landscaping.

The proposed action will have no impact on the wastewater system.

Because construction activities will occur in the road right-of-way, it is likely that the path will be located over or in close proximity to buried water and/or sewer lines. Appropriate engineering and construction methods will be employed to avoid damage to the infrastructure and to comply with all County design standards for utility systems.

4.5.3 Solid Waste Management

The County of Kaua‘i, Department of Public Works, Solid Waste Division operates the primary refuse collection system. The island has a single landfill located in Kekaha.

Potential Impacts and Mitigation Measures

Construction of the path will generate solid waste typical of normal construction-related activities. The solid waste stream will consist primarily of vegetation, rocks, and other debris resulting from clearing and grubbing. In areas where the proposed path will replace existing pavement, the proposed action will also generate old asphalt and concrete that must be recycled or disposed. The contractor will be required to have a waste disposal plan that specifies proper removal and disposal of all debris from the project area. Project-related waste material will be a small proportion of the islandwide total, and is not expected to have a large impact on the County’s solid waste facilities.

Trash receptacles will be installed along the path alignment. Therefore, once the path is operational, trash will be generated by users. As part of the regular maintenance program, receptacles will need to be emptied and the rubbish hauled to the refuse transfer station in Kapa‘a.

4.5.4 Electrical and Telecommunications Systems

Electrical System

The Kaua‘i Island Utility Cooperative (KIUC) is the local utility company that provides electrical power to service customers on the island. KIUC customers in the project area are served from two substations, the Lydgate Substation and the Kapa‘a Substation. The substation transformers step down the electrical system voltage level from 57.1 kV (transmission) to 12.47 kV (distribution). The 12.47 kV lines then distribute power to the pole-mounted and pad-mounted transformers that are used to provide secondary electrical service to individual KIUC customers.

A major KIUC overhead pole line system runs along the entire length of the Kūhiō Highway corridor. The overhead system typically consists of a 57.1 kV transmission circuit, 12.47 kV distribution circuit(s) and secondary lines mounted on joint use poles. North of Wailua River, the overhead power lines generally run on the mauka side of Kūhiō Highway. Overhead 12.47 kV circuits extend up to and generally run along Hale‘īlio, Kawaihau, and other roads to provide service to the Wailua and Kapa‘a residential areas. Pole-mounted transformers serve the smaller loads, including street lighting. Many larger loads are served from 12.47 kV lines that are run underground from the pole line along Kūhiō Highway to a pad-mounted transformer located on or near the customer’s property.

The roadway lighting system generally consists of street lights with metal arms mounted on wood utility poles. The street lights typically consist of a “cobra head” type luminaire with a high pressure sodium lamp.

Telecommunications System

Hawaii Telcom (formerly Verizon Hawaii) is the utility company that provides land line telecommunications service to customers on the island. The company’s main telecommunications lines run along the Kūhiō Highway corridor. These lines consist of a varying combination of cable (copper and fiber optic) and method of distribution (overhead and underground).

There are numerous copper cables that run along Kūhiō Highway. These copper cables support anywhere from several hundred to several thousand pairs of conductors. Except when crossing under the Wailua River and Waika‘ea Canal, these many copper cables are routed overhead. The cables are mounted on joint use poles with KIUC cables and on dedicated telecommunications poles. Thus one will find telecommunications lines running on poles on both sides of Kūhiō Highway in some locations.

Hawaiian Telcom’s fiber optic cables also run along Kūhiō Highway. These cables support from 24 up to 72 fiber optic strands in different sections along the highway. The main fiber optic cables are routed underground to the Kapa‘a Central Office. On the north side of the Kapa‘a Central Office, the fiber optic cables are routed overhead along Kūhiō Highway. Fiber optic cable extensions run underground up Hale‘ilio Road to the Wailua House Lots Remote Switching Center and overhead up Kawaihau Road.

While not owned, operated or maintained by Hawaiian Telcom, traffic signal control cables are routed overhead on poles shared with Hawaiian Telcom and/or KIUC along major portions of Kūhiō Highway. Traffic signal cables are owned, operated, and maintained by the State Department of Transportation, Highways Division.

CATV System

Oceanic Time Warner Cable is the company that provides wired cable television (CATV) service to customers on the island. The CATV distribution system generally consists of overhead lines. Oceanic Cable fiber optic and coaxial cables are run overhead on joint use and dedicated telecommunications utility poles along the length of Kūhiō Highway. Laterals are also run overhead along secondary roads to service nearby residential areas.

Potential Impacts and Mitigation Measures

Sections of the bike/pedestrian path that are located within existing road rights-of-way may have an impact on KIUC electrical transmission, distribution, and secondary systems, and telecommunications and CATV overhead systems. In places where the overhead pole line system creates barriers along the path alignment, one option is to relocate and reroute the

affected sections. The cost of relocation and the disruption to residents and businesses during the construction work would be expensive.

Another, lower cost, option is to route the path around the pole. Possible treatments will be similar to bollards and barrier posts that are erected to restrict entry by motor vehicles. The pole will be permanently reflectorized for nighttime visibility and possibly painted a brighter color for improved daytime visibility. To give users adequate warning of a barrier ahead, an envelope will be striped around the pole and the approaches marked. Where space is available, the path should bulge out around the pole so that the pavement maintains a consistent width.

Underground ducts and cables will probably remain in place, subject to more detailed design. Close coordination will be required between the County, the path contractor, and the utility companies to minimize impacts on underground lines.

4.5.5 Schools, Parks, Recreation and Community Facilities

Schools, parks, recreation, and community facilities are shown in Figure 19. There are three public schools in the Wailua-Kapa‘a region: Kapa‘a Middle School on Olohena Road and the combined Kapa‘a Elementary School and High School complex on Kawaihau Road. A private school, St. Catherine School, with pre-school and instruction in grades K-8 is also located on Kawaihau Road. The proposal to connect the Kawaihau bike/pedestrian path with the Kapa‘a-Keālia bike/pedestrian path was initiated, in large part, because of a need to provide a safe route for the large number students in Kawaihau to go to community facilities that provide resources and activities after school and on weekends.

The Kapa‘a Library, Neighborhood Center and swimming pool, and Lihi Park, the State’s small-boat ramp at Waika‘ea Canal, Kapa‘a Beach Park, and Town Park are all arrayed along the Kapa‘a-Keālia Bike/Pedestrian Path. The future County soccer fields are located two blocks inland from the path, but will still be quite accessible to the proposed path. In the future, a connector path to Kapa‘a New Park should be considered to provide improved bike and pedestrian access to this popular multi-purpose recreational site.

The proposed action will connect Wailua State Park, Lydgate Park, Wailua Beach Park, and Lihi (Waipouli) Park—creating a linear travel way that is punctuated by parks and green spaces along its entire length. The Wailua House Lots segment will connect to the Wailua House Lots Park and eventually to the Nounou Mountain Trail, which is maintained by the State’s Na Ala Hele Trails Program.

Figure 19: Community Facilities (11 x 17)

Figure 21: Community Facilities (11 x 17) (back)

Potential Impacts and Mitigation Measures

An important feature of the overall path system is linkage among various parks. The Lydgate Park to Kapa‘a segment passes through an urbanized area, yet it is anchored by parks at both ends. The Wailua House Lots phase connects to Wailua House Lots Park, and the Kawaihau phase connects to Gore Park. The will cumulative impact of a path that stretches from Lydgate Park to Keālia is to offer users unprecedented non-motorized access to recreational and cultural resources.

The proposed path will require space within existing recreational areas, specifically through Wailua Beach Park and Lihi Park. However, the path is complementary to the recreational purposes of these parks. Therefore, any conversion of park land will not diminish its use and enjoyment. Additional discussion of impacts on park facilities may be found in Appendix A: Programmatic 4(f) Evaluation for Independent Walkway or Bikeway Projects.

4.6 PUBLIC HEALTH AND SAFETY

4.6.1 Police Services

The County of Kaua‘i Police Department has three stations located approximately 25 miles apart. The main station and administrative headquarter is located in Līhu‘e; smaller stations are co-located with fire stations in Waimea and Hanalei. A small substation is located on Niu Street adjacent to Kapa‘a Beach Park. To ensure continued levels of public safety, a new County police headquarters has been constructed.

In 2001, there were 2,346 known major offenses, including murder, forcible rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft. In 2000, there were 2,578 major offenses and 2,076 major offenses in 1999.

4.6.2 Fire and Emergency Medical Services

The Fire Department’s main station and administration headquarters are located in Līhu‘e. There are six other stations, including one in Kapa‘a. The existing station is located on Kūhiō Highway, at Pouli Road. A new facility is being planned. The County has a unified, island-wide system of fire protection and rescue services. Satellite stations typically have 2-3 men per station to provide quick response to medical calls.

The island’s main trauma center is located at Wilcox Memorial Hospital in Līhu‘e, approximately five miles from the project start point. Emergency room services are also available at Samuel Mahelona Memorial Hospital in the project corridor, primarily for the treatment of non-life threatening illnesses, injuries, and conditions.

Potential Impacts and Mitigation Measures

Impacts on Public Safety Services

The proposed path is likely to increase the demand for police services. As more people use public facilities, requests for surveillance, enforcement, and possible intervention are likely to increase. Currently, the police monitor activities in the coastal and urban areas. However, the proposed canal section of the path may represent a new area for police coverage. All sections of the proposed alignment are accessible from existing streets, driveways, and parking areas. To the extent possible, the path will be designed to accommodate police vehicles for emergency response. Project designers will also work with police personnel to ensure that the facility incorporates design elements that will keep the public safe and prevent crime.

In the short-term, construction activities associated with the project may require temporary lane closures to some County roads or disruptions to portions of Kūhiō Highway. If necessary, a traffic control plan will be developed and coordinated with the State Department of Transportation and County agencies for their review and approval. Police officers may be hired to assist with implementing traffic controls during construction. These added services should not negatively impact the Department's regular operations.

The proposed action is not expected to have a sizable impact on the Department's fire protection services. There is a potential for an increased number of requests for emergency assistance and medical services related to larger numbers of people engaged in physical activity, but the increase is not expected to have an adverse impact on staff capacity or response times.

The Fire Department has indicated a desire for mauka-makai access routes, lateral access along the path alignment, and space for vehicles to turnaround. In most places, access is already provided by the existing street grid and private driveways and parking lots. More detailed path features will be addressed during the design phase of the project. Project designers will consult with fire department personnel to address emergency response needs.

Crime Impacts

Although there is considerable evidence that paths do not attract crime, this issue remains a source of concern, understandably, for people living in areas where paths are being planned. Concerns include criminal activity on the trail (such as assault and vandalism), off the trail (such as trespassing and burglary), and nuisance activity (such as littering and loud noises).

The most comprehensive study to date was conducted by the Rails-to-Trails Conservancy (RTC) in cooperation with the National Park Service (Tracy and Morris, 1998). The study examined the extent of criminal activity on 372 trails across the country. Trails were

divided by type of environment: urban, suburban, and rural. The Lydgate Park-Kapa‘a project corridor best fits the suburban profile. The RTC study covered 1,100 miles of trails on 82 suburban trails; crime data were collected for 1995 and 1996.

- The national rate of suburban muggings is 102 per 100,000 inhabitants; none of the suburban trails reported muggings in 1995 and only one mugging was reported in 1996.
- The national rate of suburban aggravated assaults is 293 per 100,000 inhabitants; 3 assaults occurred on three different suburban trails in 1995 and 2 assaults occurred on suburban trails in 1996.
- The national rate of suburban rape is 29 per 100,000 inhabitants; none of the suburban trails reported a rape in 1995 or 1996.
- The national rate of suburban murders is 4 per 100,000 inhabitants; there were no reports of murder on suburban trails in 1995 or 1996.

The following statistics were reported for minor crimes on suburban trails.

- The national rate of suburban burglary is 820 incidents per 100,000 inhabitants; only one suburban trail reported a break-in to adjacent property in 1996.
- 3% of suburban trails reported trespassing
- 17% of suburban trails reported graffiti
- 24% of trails reported littering
- 22% of trails reported sign damage
- 14% of suburban trails reported unauthorized motorized usage

The survey findings indicated that graffiti and littering were quickly corrected as part of routine trail management. Letters from law enforcement officials attested that the actual volume of incidents, such as graffiti, littering, sign damage, and motorized use, were minimal. Moreover, the study pointed out that the number of crimes directly affecting adjacent property owners was lower than the rates of trail vandalism.

The study concluded by stating:

Rail-trails are not crime-free. No place on earth can make that claim. However, when compared to the communities in which they exist, compared to highways and parking lots, and compared to many other public and private places, rail-trails have an excellent public safety record. (p. 14)

Trails and paths have a low crime rate, in part, because they attract people who use the facility legitimately for recreation and transportation. In addition, the following measures can help address the safety concerns of residents and path users:

- Eliminate overgrown vegetation and tall shrubs to minimize hiding places along the path and maintain long sight lines for users
- Place security lighting where appropriate

- Although mobile phones are becoming ubiquitous, consider emergency phones or call boxes, as well as emergency vehicle access
- Keep paths clean and well maintained to increase a feeling of community ownership of the path and reduce incidents of minor crime, such as litter, graffiti, and vandalism
- Prohibit motorized use of the path to deter property crime

Police personnel and park rangers will have primary responsibility for public safety on the path. The County DPW will monitor reports of problems and complaints on the path. Potential mitigation measures include a patrol program (voluntary or paid) that could be established to perform various functions from clean-up and maintenance to distributing information, educating path users, and emergency assistance. In addition, the neighborhood watch program could also be extended into the path corridor to provide a framework in which alert citizens can take note of and report suspicious activity.